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electrically resistive composite material layer associated with the copper metal layer shiny surface wherein the electrically resistive composite material layer includes from about 0.01 to about 99.9 area % of a conductive metal other than copper and from about 0.01 to about 99.9 area % of particles of alumina.

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28. The multi-layer foil of claim 6 wherein the non-conductive comprises alumina.

29. The multi-layer foil of claim 6 wherein the conductive metal layer comprises copper, the conductive material comprises nickel, and the non-conductive comprises alumina.

REMARKS

Claims 1-11 and 21-29 stand rejected under 35 U.S.C. 112 first and second paragraphs. It is respectfully asserted that these grounds of rejection are not well taken. It is submitted that the claims are clear, not mis-descriptive and not lacking a written description. The examiner is of the view that the final product contains a composite of *contiguous* regions of metal and non-conductive material. This is not correct. The layer is substantially homogeneous. As set forth in the claims, the electrically non-conductive particulate material is evenly dispersed throughout the conductive material. This may be visualized in Figure 9. It is therefore requested that this ground of rejection be withdrawn.

Claims 1-2, 4-5 and 21-23 stand rejected under 35 U.S.C. 102 as anticipated by abstract XP-002121182. It is submitted that this ground of rejection has been overcome since boron nitride has been deleted from the claims.

Claims 1-2, 4-7, 9-11 and 21-23 stand rejected under 35 U.S.C. 102 as anticipated by Ambros, et al. It is submitted that this ground of rejection is not well taken. The claims define:

An electrically resistive composite material consisting essentially of

an *electrically conductive material* selected from the group consisting of antimony, arsenic, bismuth, cobalt, tungsten, manganese, lead, [chromium,] zinc, palladium, phosphorus, sulfur, carbon, tantalum, aluminum, iron, titanium, [chromium,] platinum, tin, nickel, silver, copper and combinations thereof, and

an *electrically non-conductive particulate material* selected from the group consisting of silicon carbide, alumina, [silica,] platinum oxide, tantalum nitride, talc, polyethylene tetrafluoroethylene, and mixtures thereof *evenly dispersed throughout the conductive material.*

That is, the claims define a composite consisting essentially of the electrically non-conductive particulate material evenly dispersed throughout the conductive material. In contrast, Ambros provides a resistor paste of a polymeric binder such as a melamine-formaldehyde or alkyd resin having both electrically conductive and/or electrically non-conductive particles dispersed within the polymeric binder. The present invention is distinguishable from such a composite requiring such a polymeric binder matrix. It would not be sufficient for non-conductive particles and a conductive material to simply be present in order to satisfy the instant claims. The claimed composite must consist essentially of the electrically non-conductive particulate material evenly dispersed throughout the conductive material. It is therefore submitted that this ground of rejection should be withdrawn.

Claims 1, 3, 11 and 22-23 stand rejected under 35 U.S.C. 102 as anticipated by Butz, et al. It is submitted that this ground of rejection is not well taken. Butz, et al provides a biaxially oriented polymeric film having particles such as silica, graphite and bronze dispersed through the film. The composite of this invention is not such a biaxially oriented polymeric film. Indeed such a composite is not orientable like a film at all. It would not be sufficient for non-conductive particles and a conductive material to simply be present in order to satisfy the instant claims. The claimed composite must consist essentially of the electrically non-conductive particulate material evenly dispersed

throughout the conductive material. It is therefore submitted that this ground of rejection should be withdrawn.

Claims 1, 4-7, 9, 11, 22-23 and 27 stand rejected under 35 U.S.C. 102 as anticipated by Croson. Silica and chromium have been deleted from the claims. It is submitted that this ground of rejection is overcome by the above amendment.

Claims 1-2, 4-7, 9, 11, 22-23 and 27-28 stand rejected under 35 U.S.C. 102 as anticipated by Yamada, et al. It is submitted that this ground of rejection is not well taken. Like Ambros and Butz above, this reference requires a polymeric binder, in this case a crystalline polymer having particles of carbon black or alumina dispersed in the polymer binder. This is distinctly different from the present invention wherein no such polymeric binder is employed. The claimed composite must consist essentially of the electrically non-conductive particulate material evenly dispersed throughout the conductive material. It is therefore submitted that this ground of rejection should be withdrawn.

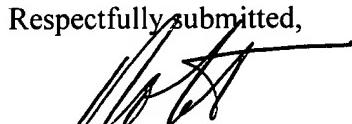
Claims 3, 8, 10, 21 and 26-29 stand rejected under 35 U.S.C. 103 as obvious over Yamada, et al. in view of Chandler. It is submitted that this ground of rejection is not well taken. The arguments concerning Yamada, et al are repeated from above. Chandler also provides a conductive polymer binder with a metal or metal oxide filler. This is distinctly different from the present invention wherein no such polymeric binder is employed. The claimed composite must consist essentially of the electrically non-conductive particulate material evenly dispersed throughout the conductive material. It is therefore submitted that this ground of rejection should be withdrawn.

Claims 3, 6-11 and 24-29 stand rejected under 35 U.S.C. 103 as obvious over XP-002121182 in view of Clouser, et al, Castonguay or Lindblom, et al. It is submitted that this ground of rejection is not well taken. XP-002121182 is not applicable since boron nitride has been deleted from the claims. Clouser, et al teaches a resistive layer of a chromium metal together with carbon, nitrogen or phosphorus. This does not suggest the

two component system of the instant claims. Castonguay et al. describes a circuit board having a resistive material layer which comprises electroplated nickel together with up to 30 percent by weight of phosphorus. This does not suggest the two component system of the instant claims. Lindblom, et al shows a non-conductive layer 28 on a conductive layer 22. There is no layer which has non-conductive particles evenly dispersed through a conductive material. It is therefore submitted that no combination of these references suggest the instant claims.

The undersigned respectfully requests re-examination of this application and believes it is now in condition for allowance. Such action is requested. If the examiner believes there is any matter which prevents allowance of the present application, it is requested that the undersigned be contacted to arrange for an interview which may expedite prosecution.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage pre-paid in an envelope addressed to Assistant Commissioner for Patents, Washington, D.C. 20231, on September 7, 2001



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